

I CLAIM

*Sub.*

1. A solenoid-operated valve assembly for an automatic transmission of a motor vehicle, comprising:  
5 a valve body having a control chamber, mutually spaced first, second and third ports communicating with the control chamber;

10 a valve spool supported for movement along the control chamber, including a shank, a first land adapted to open and close the first port, the first land having a feedback chamber and a feedback orifice connecting the feedback chamber and second port; and a second land located at an opposite end of the shank from the first land and adapted to open and close the third port; and  
15 a spring urging the valve spool to move along the control chamber; and

20 a solenoid assembly having an armature axially displaceable in response to an electric signal supplied to a coil, the armature urging the valve spool to move along the control chamber.

2. The valve assembly of Claim 1 further comprising:

25 a source of low pressure;

wherein the valve body further includes a scaling orifice connecting the feedback chamber and the source of low pressure.

30 3. The valve assembly of Claim 1 wherein the length of the feedback orifice is relatively short.

4. The valve assembly of Claim 1 wherein the first land and second land have substantially equal diameters.

5. <sup>Sub.</sup> The valve assembly of Claim 1 wherein the first land has a larger diameter than the diameter of the second land.

10 6. The valve assembly of Claim 1 wherein the first port is adapted for connection to a source of supply pressure, the third port is adapted for connection to a source of low pressure, and the second port is adapted to produce control pressure achieved by balancing supply flow from the first port, vent flow to the third port, and control flow to and from the load.

15 7. A solenoid-operated valve assembly for an automatic transmission of a motor vehicle, comprising:

20 a valve body having a control chamber, first, second and third ports spaced mutually along, and communicating with the control chamber;

25 a valve spool located within the control chamber, including a shank, a first land adapted to open and close the first port and having a first end and second end, a second land located at a opposite end of the shank and adapted to open and close the third port, the second land having a larger diameter than the diameter of the first land;

30 a damping orifice facing the first end, communicating the control chamber adjacent the first end and a source of low pressure fluid;

a spring urging the valve spool to move along the control chamber; and

a solenoid assembly having an armature axially displaceable in response to an electric signal supplied to a coil, the armature urging the valve spool to move along the control chamber.

5

8. The valve assembly of Claim 7 wherein the first control land includes a control edge located at a radially outer surface of the first land at the second end, and a radial step defining an annular surface extending radially between the shank and control edge, and wherein the feedback passage is directed radially and axially from the bore to the annular surface.

Sub.

13. 9. The valve assembly of Claim 7 wherein the first port is adapted for connection to a source of supply pressure, the third port is adapted for connection to a source of low pressure, and the second port is adapted to produce control pressure achieved by balancing supply flow from the first port, vent flow to the third port, and control flow to and from the load.

10. The valve assembly of Claim 9, wherein the source of fluid at low pressure is a volume of fluid contained apart from the valve assembly.

25

11. The valve assembly of Claim 9, wherein the source of fluid at low pressure is a volume of fluid contained in the valve assembly.

30

12. A solenoid-operated valve assembly for an automatic transmission of a motor vehicle, comprising:

1 a valve body having a bore, mutually spaced  
first, second and third ports communicating with the  
bore;

5 2 a valve spool supported for movement along the  
bore, including a shank, a first land adapted to open and  
close the first port and having an axial bore extending  
partially along the first land from the first end thereof  
toward the second end, a feedback orifice in the first  
10 land communicating the second port and said axial bore in  
the first land, said feedback orifice being substantially  
shorter in length and smaller in diameter than said axial  
bore in the first land;

15 3 the first control land including a control edge  
located at a radially outer surface of the first land at  
the second end, and a radial step defining an annular  
surface extending radially between the shank and control  
edge, and wherein the second feedback orifice extends  
from the bore to the annular surface;

20 4 a spring urging the valve spool to move along  
the control chamber; and

25 5 a solenoid assembly having an armature axially  
displaceable in response to an electric signal supplied  
to a coil, the armature urging the valve spool to move  
along the control chamber.

13. The valve assembly of Claim 12 further  
comprising:

a source of low pressure;

30 wherein the valve body further includes a  
scaling orifice connecting the feedback chamber and the  
source of low pressure.

14. The valve assembly of Claim 12 wherein the first land and second land have substantially equal diameters.

5 15. The valve assembly of Claim 12 wherein the first land has a larger diameter than the diameter of the second land.

10 16. The valve assembly of Claim 12 wherein the first port is adapted for connection to a source of supply pressure, the third port is adapted for connection to a source of low pressure, and the second port is adapted to produce control pressure achieved by balancing supply flow from the first port, vent flow to the third port, and control flow to and from the load.

24  
25